5. ALTERNATIVES ANALYSIS

In addition to the relevant environmental statutes, the FAA in its consideration of alternatives, has been mindful of its statutory charter to encourage the development of civil aeronautics and safety of air commerce in the United States (*49 U.S.C. 40104*). FAA has also considered the congressional policy declaration that airport construction and improvement projects that increase the capacity of facilities to accommodate passenger and cargo traffic be undertaken to the maximum feasible extent so that safety and efficiency increase and delays decrease (*49 U.S.C. 47101(a)(7)*).

While the FAA does not have the authority to control or direct the actions and decisions of the STLAA relative to planning for this project, it does have the authority to withhold project approval, including Federal funding and the other Federal actions discussed in this ROD. It was from this perspective that the various alternatives were considered in terms of evaluating and comparing their impacts to determine whether there was an alternative superior to that proposed by STLAA, or whether STLAA's proposal would cause impacts warranting disapproval of the Federal actions discussed in this ROD, including the withholding of Federal funds for the project.

The FAA identified numerous alternatives to the proposal (reference FEIS Section 3.2). During this exploration of alternatives, all reasonable alternatives were carefully examined, ranging from doing nothing to specific runway alignments at Lambert. After considering all reasonable alternatives, the FAA selected the construction of Runway 12W/30W and associated projects as the agency’s preferred alternative in the FEIS. The FAA identified Alternative X-1, the No-Action Alternative, as the environmentally preferable alternative. Other alternatives were eliminated for a variety of reasons as discussed below.

The DEIS alternatives evaluation utilized a three-tiered evaluation process that concentrated on the purpose and need for the proposed project. The first tier evaluated whether the various alternatives met the purpose and need criteria established in Section 2.0 of the DEIS. Alternatives that satisfied these criteria were retained for evaluation under the second tier of analysis. The second tier evaluated the "constructability" (ability to phase and construct the alternative while maintaining continuous 24-hour operations, ability to maintain the hub at Lambert, and ability to operate the terminal and existing runways during construction), and the benefit/cost ratio (BCR) of the alternatives (BCR of less than “1” indicates costs outweigh economic benefits, greater than “1” indicates economic benefits outweigh costs). Alternatives that met these criteria were retained for evaluation under the third tier of analysis. The third tier evaluated multiple specific criteria relating to operational efficiency (taxi times, delay times), cost per passenger (lower costs vs. higher costs) and environmental impacts (noise, land use, social, etc.).

As part of Tier 3, the FAA analyzed the best representative alternatives from the remaining families of alternative runway alignments. The best representative selected for detailed analysis within each family was the best overall environmentally, particularly as to resources protected under special purpose environmental laws. This approach is consistent with guidance in CEQ's Forty Questions (Question 1), which provides that: "When there are potentially a very large number of alternatives, only a reasonable number of examples, covering the full spectrum of alternatives, must be analyzed and compared in the EIS. ... What constitutes a reasonable range of alternatives depends on the nature of the proposal and the facts in each case."

Alternatives that met the criteria under the third tier of analysis, were the best in their families and had the least overall environmental impact were retained for detailed analysis in subsequent sections of the DEIS. Table S.1 contains a summary of the tiered analysis used in the alternatives analysis for the DEIS (Appendix J of this ROD, FEIS Summary).

The alternatives explored in the FEIS include the following:

REASONABLE ALTERNATIVES EXAMINED AND ELIMINATED FROM DETAILED ANALYSIS

- Other modes of transportation, including surface transportation alternatives such as rail, bus and automobiles.

- Construct a new airport to replace Lambert.

- A multiple-airport system with a supplemental airport in addition to Lambert.

- Airfield alignment alternatives:
  - North Airfield Alternatives: N-1, NE-1, NE-1a
  - West Airfield Alternatives: W-1E, W-2
  - South Airfield Alternatives: Modified S-1
  - Canted Airfield Alternative: C-1

- Other on-airport alternatives:
  - Bridgeton's Lambert 2020 Plan
  - Hyland Plan
  - Alternative runway lengths
  - Existing facility with advanced navigational aids

These alternatives were rejected for the following reasons:

1. Other modes of transportation do not fulfill the main needs for improving Lambert. They do not meet local aviation needs, nor enhance the economic contribution of Lambert to the region, or strengthen Lambert's role in the NAS. Other modes, including automobiles, buses and rail, have a complementary role to air travel, not a replacement one. Further, the other modes do not provide the fast, flexible and efficient long-distance transportation needed by the public and provided by Lambert.

2. The construction of a new regional airport is not a viable solution to satisfy the projected capacity deficiency at Lambert in the foreseeable future due to time and cost requirements.

3. Although several other airports exist in the region, none--individually or collectively--can adequately accommodate the anticipated traffic from Lambert, fulfilling the need for the new runway. Multiple reasons are responsible: airline hubbing, lack of facilities at other airports, detrimental environmental impacts and airspace conflicts and constraints.

4. Although several on-airport runway alignment alternatives were considered, most were eliminated from detailed study. The FEIS examined in detail only those alternatives that provide for a similar magnitude of development and have the capability of providing simultaneous independent IFR arrival operations, which are considered critical to the operation of the airline hub. The airfield alignment alternatives and other on-airport alternatives not retained for detailed study were considered either: (a) to be infeasible and/or imprudent (in the case of alternatives not retained at Tiers 1 or 2), or (b) to present equivalent or greater impacts to parks and wetlands (in the case of alternatives not retained at Tier 3, the “best in family” comparison).

ALTERNATIVES CONSIDERED IN DETAIL

No-Action Alternative (X-1)

The No-Action Alternative would not accomplish the critical elements of the purpose and need that the selected alternative will provide. The No-Action Alternative (X-1) is depicted in Figure S.1 of the FEIS Summary (Appendix J of this ROD). Although the No-Action Alternative would be the least disruptive in terms of development impacts, it

would not solve the capacity needs or delays existing at Lambert Airport, and thus would not achieve the purposes and needs for the proposed action. The No-Action Alternative would not provide capacity, delay reductions nor benefits to the community. In addition, the No-Action Alternative would not give Lambert the necessary operating flexibility provided by the selected alternative. To do nothing would, under some circumstances, actually exacerbate environmental conditions; for example, selection of the No-Action Alternative would worsen air quality as compared to the selected alternative. The environmental impacts associated with Alternative X-1 include increased air emissions and energy consumption due to added delay.

Alternative S-1

Alternative S-1 consists of the following developments, which would be initiated and/or completed by the year 2002:

- Land acquisition (approximately 1,332 acres) and associated relocation of homes and businesses.
- Construction of a new 9,000-foot parallel runway south of highway I-70. The new runway would be laterally separated by at least 5,500 feet from existing Runway 12L/30R. Although a PRM, for enhanced air traffic control of existing operations, has been installed at Lambert (projected commissioning scheduled for November 1998), Alternative S-1 would not require the use of a PRM.
- Construction of two new dual taxiway bridges across I-70.
- Construction of related taxiways, lighting, navigational aids, grading, drainage and utility relocations.
- Implementation of air traffic control procedures below 3,000 feet above ground level (AGL).
- Renovation and expansion of existing terminal facilities and associated aprons.
- Demolition of portions of the East Terminal Complex for Connector Taxiway construction.
- Relocation of airline support facilities.
- Implementation of mitigation measures and acquisition of permits.
- Improvements to I-70/Airport Terminal Interchange.

- Relocation of the Missouri Air National Guard (MoANG) and Navy/Marine Corps Reserve facilities.

- Realignment of McDonnell Boulevard, Lambert International Boulevard, and portions of the Metro Link light rail.

- Closure of numerous local roads between I-70 and what would become Lambert's new southern boundary.

Alternative S-1 also has one Phase II project that would be developed between the years 2002 and 2015:

- Construction of new landside terminal facilities, west of the existing terminal, possibly located at the current location of the MoANG and Navy/Marine Corps Reserve facilities. A portion of the terminal facilities may be located west of Runway 6/24.

The S-1 Alternative is depicted in Figure S.2 of the FEIS Summary (Appendix J of this ROD).

The S-1 concept was refined during the DEIS to ensure that the proposed parallel taxiways over I-70 would meet FAA design criteria. It was found that both pairs of taxiways would need to be shifted in order to meet FAA taxiway grade criteria of 1.5 percent. The shift in the east pair would require demolition of the East Terminal Complex and relocation of a portion of the Metro Link commuter rail system. The shift in the west pair from a perpendicular alignment to a slightly northwest diagonal alignment was also necessary to allow the taxiways to clear I-70 and meet FAA taxiway grade criteria.

Operational Considerations

Operationally, Alternative S-1 fulfills all of the first tier purpose and need review criteria, because it would allow dual simultaneous IFR arrival operations during IMC, improve VFR capacity at Lambert, help enhance the NAS, allow the passenger hub to remain at Lambert, and would be consistent with local planning and economic goals.

Of the reasonable alternatives retained for detailed evaluation, the FAA acknowledges that Alternative S-1 is superior from an operational standpoint. Alternative S-1 has a shorter stagger of runway threshold locations than Alternative W-1W. The absence of this stagger eliminates the double dependency of departures from the future center runway (existing Runway 12R/30L) with arrivals on the outboard runways (30R and 30W) in west flow conditions. Alternative S-1 would be more airfield-efficient and would reduce taxi times when compared to Alternative W-1W.

Financial Feasibility

A detailed analysis of the financial implications of each of the reasonable alternatives was prepared as part of the MPS. The results of this analysis indicate that for Alternative S-1, year 2015, the total savings in annual aircraft operating cost is calculated to be $329 million, cost per passenger is projected at $13, total construction cost is estimated to be $2.4 billion and the BCR is calculated to be 1.8. With a BCR of 1.8, the economic benefits of implementing this alternative are almost twice as great as the costs associated with its construction. However, the refined design of Alternative S-1, shifting the taxiways, would add approximately $75 to $100 million to the cost of Alternative S-1. This would bring the cost of Alternative S-1 up to approximately $2.5 billion and the per-passenger cost to over $13. The BCR would consequently be reduced to less than 1.8.

Environmental Impacts

Alternative S-1 would result in adverse environmental impacts including: the acquisition and displacement of established land uses, such as homes, schools, churches, and businesses; shifting aircraft noise exposure patterns over sensitive areas; impacting park and archaeological resources; requiring development in wetland and floodplain areas and potentially disrupting several hazardous materials sites.

Alternative S-1 would require the acquisition of approximately 4,528 households (relocating approximately 9,725 people), 210 businesses, 8 schools and 6 churches. The areas of acquisition would include the northern part of the City of St. Ann (displacing approximately 2,556 people), all of the City of Edmundson (approximately 1,107 people), two-thirds of the City of Woodson Terrace (2,640 people), the southwest part of the City of Berkeley (1,847 people), part of Bridgeton (406 people) and part of the City of St. John (1,169 people). Operations on the new south runway could increase aircraft noise levels at the University of Missouri-St. Louis campus to the southeast. Alternative S-1 would directly affect nine park and recreational areas (57 total acres), requiring replacement.

Alternative W-1W

Alternative W-1W consists of the following developments, which would be initiated and/or completed by the year 2002 (Phase I):

- Land acquisition (approximately 1,568 acres) and associated relocations of homes and businesses.

- Construction of a new runway complex parallel to and southwest of existing runways 12L/30R and 12R/30L. Runway 12W/30W would be 9,000 feet in length and 150 feet in width and would be capable of handling air carrier jet aircraft. The parallel runway would be laterally separated by 4,100 feet from existing Runway 12L/30R and would be south and west of existing Runway 6/24. A PRM, for enhanced air traffic control of existing operations, has been installed at Lambert (projected commissioning scheduled for November 1998). Alternative W-1W would require the use of a PRM.

- Construction of related taxiways, lighting, navigational aids, grading, drainage, and utility relocations.

- Implementation of air traffic control procedures below 3,000 feet AGL.

- Renovation and expansion of existing terminal facilities and associated aprons.

- Relocation of airline support facilities.

- Relocation of the MoANG and Navy/Marine Corps Reserve facilities.

- Realignment of Lindbergh Boulevard and construction of a roadway tunnel for those portions of Lindbergh Boulevard impacted by the construction of the new runway and the optional future extension of existing Runway 12R/30L.

- Realignment or relocation of roadways, including Natural Bridge Road, Bonfils Road, Fee Fee Road, Cypress Road, Gist Road, Lambert International Boulevard, Missouri Bottom Road and McDonnell Boulevard.

- Improvements to the I-70/Airport Terminal Interchange.

- Implementation of mitigation measures and acquisition of permits.

Alternative W-1W, Phase II projects that would be developed between the years 2002 and 2015 include the following:

- Construction of new landside terminal facilities (up to approximately 110 gates), west of the existing terminal, possibly located at the current location of the MoANG and Navy/Marine Corps Reserve facilities. A portion of the terminal facilities may be located west of Runway 6/24.

Phase III projects are beyond the 20-year planning period and are not specifically programmed for implementation. Possible projects that may be developed in Phase III, after the year 2015, include:

- Construction of a 2,500-foot extension to the northwest end of existing Runway 12R/30L.
- Additional construction of new west landside terminal facilities.
- Construction of a new airport access roadway from I-270 to the new west landside terminal complex.
- Demolition of the existing terminal complex and construction of new east airfield terminal concourses.

Alternative W-1W is depicted in Figure S.3 of the FEIS Summary (Appendix J of this ROD).

Operational Considerations

Operationally, Alternative W-1W fulfills all of the first tier purpose and need review criteria in the FEIS, because it would allow dual simultaneous IFR arrival operations, improve VFR capacity at Lambert, help enhance the NAS, allow the passenger hub to remain at Lambert and would be consistent with local planning and economic goals.

Financial Feasibility

The results of the MPS financial feasibility analysis indicate that for Alternative W-1W, in the year 2015, the total savings in annual aircraft operating cost is calculated to be $297 million, cost per passenger is projected at $10.50, total construction cost is estimated to be $2.2 billion, and the BCR is calculated to be 2.2. The BCR of 2.2 indicates that the economic benefits of implementing this alternative are more than twice as great as the costs associated with its construction. An independent benefit/cost analysis (BCA), conducted by FAA's Systems and Policy Analysis Division (APO-200), determined that Alternative W-1W had a BCR of 2.6.

Environmental Impacts

The adverse environmental impacts that would result from Alternative W-1W include the acquisition and displacement of established land uses including homes, schools, churches and businesses; shifting aircraft noise exposure patterns over sensitive

areas; impacting park, historic and archaeological resources; requiring development in wetland and floodplain areas and potential disruption of several hazardous materials sites.

Alternative W-1W would require the acquisition of approximately 2,324 households (relocating approximately 5,680 people), 75 businesses, 6 schools, 6 churches and one nursing home for airfield development and surface transportation improvements. The areas of acquisition would be in the City of Bridgeton (displacing approximately 5,404 people), and the City of St. Ann (displacing 276 people). Alternative W-1W would directly affect four park and recreational areas (26 total acres), requiring replacement. The 12W end of the proposed runway would also be located within 10,000 feet of an existing active landfill and would not be consistent with FAA's current runway siting guidelines without mitigation.

THE FAA'S SELECTED ALTERNATIVE (ALTERNATIVE W-1W)

The FAA finds that the selected alternative is preferred principally because it enhances capacity and reduces delay for Lambert and the total NAS. The FAA in this ROD approves the preferred alternative.

Alternative W-1W was selected rather than Alternative S-1 because it meets purpose and need and is environmentally superior to S-1. Alternative W-1W has fewer impacts on people to be relocated, and less severe impacts on resources protected under special purpose laws (e.g., parks, wetlands).

The FAA has made its required special purpose law determinations that there is no possible, prudent and practicable alternative to Alternative W-1W, based upon the following information (see also Appendix J of this ROD, Table S.1A, page S-9):

- Both development alternatives would have unavoidable impacts on resources protected under Section 303 of the Department of Transportation Act and Section 6(f) of the Land and Water Conservation Fund Act. There are no possible or prudent alternatives to the use of these resources. Alternative W-1W will use approximately half the park and recreational resources and acres that would be required for Alternative S-1.

- Both Alternatives W-1W and S-1 would have unavoidable wetland impacts due to the proximity of wetlands to the airport. Consequently, there are no practicable alternatives to filling of wetlands. Alternative W-1W has the least amount (acreage) of wetland impacts.

- There is no practicable alternative to the floodplain impacts of Alternative W-1W. Mitigation measures to minimize the floodplain impacts can be accomplished. The floodplain encroachment will not be considered significant.

The FAA has also considered that the preferred alternative proposed in the FEIS has withstood extensive public scrutiny throughout the public involvement process. The FAA recognizes that some segments of the community strongly oppose Alternative W-1W. Lambert has been conducting ongoing negotiations with the neighboring cities to resolve issues related to the impacts and mitigation proposed in the FEIS.

Because the FAA determined that Alternative W-1W is the least impacting alternative, overall, it selected Alternative W-1W as the preferred alternative. A comparative table summarizing Alternatives X-1, S-1 and W-1W is contained in Table S.2 of the FEIS Summary (Appendix J of this ROD).

However, a few key comparisons of impacts to the communities are:

	Alternative S-1	**Alternative W-1W**
Number of people to be relocated	9,725	5,680
Number of households to be relocated	4,528	2,324
Number of residential parcels to be acquired	2,902	1,937
Number of businesses to be relocated	210	75
Number of schools to be acquired	8	6
Number of churches to be acquired	6	6
Number of nursing homes to be acquired	0	1
Number of parks directly affected	9	4
Acreage of parks directly affected	57	26
Acreage of parks affected	10.8	9.7
Acreage of floodplains affected	51	57

Accordingly, having considered: (1) the policies set forth at *49 U.S.C. Sections 40104 and 47101*, (2) the ability of the alternatives to meet the purpose and need, and (3) the administrative record which concerns these development projects, the FAA hereby selects the W-1W development recommended in the FEIS.

The FAA's approval of these expansion and improvement projects in this ROD signifies that these projects meet FAA standards for agency approval discussed in Section 3 of this ROD. It does not, however, signify an FAA commitment to provide a specific level

of financial support for these projects, which must await future decisions under the criteria prescribed by *49 U.S.C. 47115(d) and 49 U.S.C. 40117*.